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COLLEGE PARK CAMPUS
Remote Sensing Systems Laboratory

(E86-10023 NASA-CR-176377) [ACTIVITIES OF
THE PILOT LAND DATA SYSTEM PROJECT] Interim
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15 November 1985

Dr. Robert Price
Project Manager
Science Scenario
Pilot Land Data System Project
Code 620
NASA/Goddard Space Flight Center
Greenbelt, MD 20771

Dear Dr. Price:

It is my pleasure on behalf of the University of Maryland's Remote Sensing Systems Laboratory to submit to you for your information an interim progress report on the work being conducted here within the Pilot Land Data System project.

During this reporting period, the Remote Sensing Systems Laboratory, through its collaboration with Goddard Space Flight Center, has addressed the following tasks.

- 1) Identifying data types and data sources needed to describe the selected test sites in collaboration with Goddard's Hydrological Sciences Branch.
- 2) Definition of the detailed procedures necessary to access/acquire this data.
- 3) Conduct a number of technical meetings with the PLDS Systems Engineering Group to identify functional specification priorities for PLDS development.
- 4) Assembling documentation on historical remotely sensed imagery and transfer of such information to the PLDS Data Management Group.
- 5) Collection of data identified by Goddard's Hydrological Sciences Branch for data set inventory in PLDS.
- 6) Development of a Workstation-PLDS system interface over high speed lines.
- 7) Development and testing through a Phase I demonstration of a micro workstation to access PLDS.
- 8) Establishment of interdepartmental agreement and development of computer link for electronic access of water resources data from USGS.

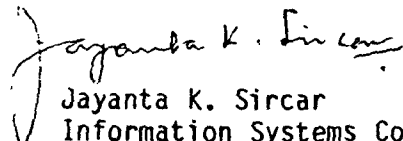
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Dr. Price
15 November 1985
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I am enclosing some details of the Task descriptions and accomplishments in the following pages. Please feel free to contact me if you need any further details.

Sincerely yours,


Jayanta K. Sircar
Information Systems Coordinator
(Co-Investigator PLDS project)

JKS:slt

Enclosure

Task 1 - Data Type Identification

In the build I phase of the PLDS, the following data types have been identified as suitable for both meeting the PLDS data management design objectives and the immediate requirements of the hydrological science scenario:

- a) AVHRR Gac and Lac format data
- b) Landsat Multispectral Scanner data
- c) Nimbus SMMR data

Task 2 - Data Processing Requirements

The following data processing needs have been identified as being of priority to the application scientists at Goddard. It is to be stressed that such needs have been identified not merely as being important to the short term objectives of the science project RTOP's, but has been formulated as of generic importance to any practical data utilization scheme by a wide number of science users. The identified data processing requirements are:

- a) To obtain from PLDS a comprehensive description of identified data sets, and related access information.
- b) To access PLDS and obtain such data for selected regions from PLDS data archives.
- c) To extract to selectively access such data in specified geographical regions.
- d) To modify data resolutions to user specifications.
- e) To register between data sets of different types and dates.
- f) To perform necessary radiometric correction to data sets.
- g) Application of spatial analysis algorithms to such data sets.

Task 3 - System Engineering Specifications

Biweekly meetings were held with the System Engineering Group of PLDS and through intensive technical discussions with all collaborative individuals, the following accomplishments have been achieved:

- a) Design of detailed PLDS Project Plan, FY'86.
- b) Selection of system engineering priorities for FY'85 and FY'86.
- c) Transfer of representative data sets for use by Data Management team in PLDS design.
- d) A Phase I demonstration of PLDS capability.

Task 4 - Documentation

A number of documents on AVHRR, Global SMMR and Landsat have been collected and transferred to PLDS Data Management team, as part of Phase I Data Inventory/Catalog of PLDS. The documents relate to data access sources, description of physical characteristics and ancilliary satellite information relevant to subsequent data storage/archiving and processing.

Task 5 - Data Collection

The following data sets have been collected and transferred to PLDS data management team.

- I. AVHRR, NSS.GHRR.N6 Data, 5 files, J. Sircar/UMD Office GAC.Packed, Texas-Oklahoma
- II. GRNDAT, USDA Land Use J. Sircar/UMD Office 1983 Ground Data
- III. USTC2-SMMR, 3 files J. Sircar/UMD Office File 1 - 3 rec, File 2,3 - 12 rec.

Task 6 - Phase I Demonstration of PLDS Capability

As mentioned above, the interface between the RSSL and PLDS workstation was tested including the access of PLDS, to communicate with PLDS and to actually process data across the NSSDC node to the LAS system and subsequently to the MPP in real time.

Task 7 - Workstation Interface

An important accomplishment in this reporting period has been the establishment of a communication interface at 4800 bps between the RSSL and Goddard NSSDC PLDS Link. The following tasks were addressed:

- a) Use of Ethernet TCP/IP protocol within the University of Maryland Engineering Building LAN to test the feasibility of and to develop the micro-processor program interface to implement TCP/IP file transfer.
- b) As a result of accomplishing the above, it is anticipated that on the completion of the gateway system to ARPANET and the internal cabling of the broad-band ethernet, there will be a direct 56 kbps linkage to Goddard with necessary software at the workstation end to provide a friendly interface to PLDS.
- c) As an alternative to Ethernet communication, the RSSL has also addressed the Asynchronous RS232 mode of file transfer. A public domain software to emulate a VAX VT102 terminal has been installed on the RSSL IBM AT workstation to provide the user a 4800 bps link over telephone lines to Goddard.

However, it was experienced that this software and a range of others (Hayes 125, PC-Talk, Kermit) did not have a viable means of binary file transfer with any level of sophisticated error checking. As a result, the Xmodem protocol (public domain program) was installed on the NSSDC VAX, and the software modified to permit both checksum error and cyclic redundancy code checking with host-micro handshake. The public domain software (PC-VT) was also adjusted to enable the transfer of records larger than 128 bytes (for ASCII files) without the loss of bytes due to terminal wraparound.

- d) The communication software was integrated with the RSSL workstation engineering analysis package to permit ready access to external data systems.

FUTURE DIRECTIONS

The present experience generated through the above tasks, has resulted in identifying these immediate needs in meeting the long term goals of the project.

- 1) Establishment of Ethernet link to APPANET, thereby enabling to communicate at speeds that would be more practical for image data manipulations.
- 2) Experimenting with asynchronous communication as a low cost alternative for potential PLDS users.
- 3) Development of workstation support for the hydrologic science scenario.
- 4) Development of application oriented science mission tasks for the optimal use of MPP through the workstation.